

# George-Paul O'Byrne

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## Education

### School of Medicine, University of Limerick

*Bachelor of Medicine and Surgery (BMBS)*

ongoing: Y3/4

Limerick, IE

### University of Saskatchewan

*M.Sc. in Physiology (specialization in neuroscience and psychiatry)*

2019 – 21

Saskatchewan, CA

### University of Saskatchewan

*B.Sc. Hons. in Physiology and Pharmacology*

2015 – 19

Saskatchewan, CA

## Postgraduate Coursework

- Advanced Functional Neuroanatomy
- Experimental Animal Surgery
- Functional Neuroscience
- Rhetorical Communication
- Molecular Pharmacology
- Statistics/Bioinformatics

## Academic Research Experience

### Summer Studentship - Prostate Cancer Biostatistics

May – Aug 2022

*School of Medicine, University of Limerick*

Limerick, IE

- Performed principal component analyses on a large multivariate dataset of Irish patients with prostate cancer for a project investigating novel biomarkers that could improve prostate cancer screening. Presented the findings of my analyses to a mixed group of clinical & academic collaborators.

### Research Assistant - Cell Signaling Laboratory

Mar – Aug 2021

*Dept. of Psychiatry, University of Saskatchewan*

Saskatoon, CA

- Generated a manuscript based my master's thesis, to be submitted for publication. Aided in dissection, lysis and Western blotting of brain tissue for study of cell signaling in Alzheimer disease. Presented and critiqued microbiome research at the WCVH Hill Lab Journal Club.

### Grad Student - Physiology/Neuroscience

Apr 2019 – Mar 21

*Dept. of Physiology, University of Saskatchewan*

Saskatoon, CA

- Learned to navigate the UNIX terminal shell, various software applications used to process large volumes of genomic data, and statistical tools appropriate for working with compositional datasets.
- Authored, revised, and successfully defended a 132-page thesis describing the background, methodology, findings and implications of my master's project.

## Employment History

### Center for Talented Youth (CTYI) Ireland | *Instructor*

July – Aug 2023

- Taught week long courses in medicine, biotechnology, biochemistry, and microbiology.

### Hear2Understand Audiology Clinic | *Behavioural Consultant*

Nov 2019 – Mar 21

- Supported families of children newly diagnosed with neurodevelopmental disorders; provided parents with clear & accurate information about their child's diagnosis, plus local support services.

### Sci-Fi Science Camps, Usask College of Engineering | *Student Instructor*

Apr – Aug 2019

- Taught weekly science camps to children of varying ages and social backgrounds; helped design the *Health Sciences*, *Forensic Sciences*, *Chemistry*, and *Veterinary Medicine* courses; collaborated with team members on a series of educational videos published online during the COVID-19 pandemic.

### Social Services, Govt. of Saskatchewan | *Residential Care Aide*

May 2017 – Aug 18

- Provided physical care and psychosocial support to adults living with physical and cognitive disability.
- Received training in conflict resolution and learned to de-escalate behavioral crises safely & respectfully.

## Leadership & Extracurriculars

<b>PSiREN – Student Research Group</b>   <i>Co-founder, Vice-chair</i>	<b>Feb 2024 – present</b>
Helped found a student research collaborative with some colleagues from University College Cork (UCC) and RCSI. (The name stands for 'Progressive Solutions in Radiology, Engineering & Neurosurgery').	
<b>Walter E. Dandy Neurosurgical Society, Irish Chapter</b>   <i>Founder &amp; President</i>	<b>Sep 2023 – present</b>
Started an Irish chapter of the Dandy Society in order to demonstrate my interest in the field of neurosurgery, meet like-minded students, and further develop my own leadership skills.	
<b>Neurology &amp; Neurosurgery Interest Group (NANSIG)</b>   <i>Regional Lead, Neurosurgery</i>	<b>Oct 2023 – present</b>
Responsible for coordinating and overseeing any and all activities, events, and initiatives relating to neurosurgery at the University of Limerick/surrounding area.	
<b>UL Neuro Research Group, UL Surgical Society</b>   <i>Founder &amp; Current Leader</i>	<b>Sep 2023 – present</b>
Started a subcommittee of UL Surgical Society dedicated to helping students get involved with ongoing research related to neurology & neurosurgery.	
<b>Peer Drugs Limerick</b>   <i>Founder &amp; Lecturer</i>	<b>Sep 2022 – Jan 23</b>
Designed and launched a peer-learning initiative wherein student volunteers provide weekly online review sessions covering clinically-important pharmacology concepts.	
<ul style="list-style-type: none"><li>• Collaborated with UL faculty to make sure lectures were accurate and that material covered complemented the curriculum.</li><li>• Presented sessions on pharmacokinetics and pharmacodynamics.</li></ul>	

### Awards

First Prize – Internal Surgical Case Presentation Competition   <i>University Hospital Limerick</i>	<b>2024</b>
Gold Medal – President's Volunteer Award   <i>University of Limerick</i>	<b>2023</b>
Regional Lead in Neurosurgery   <i>NANSIG UK</i>	<b>2023</b>
Eva Safian Memorial Award   <i>University of Saskatchewan</i>	<b>2019</b>

## Professional Development

### Clinical attachments

<b>Neurosurgery, Beaumont Hospital</b> – with Ms. Catherine Moran, <del>Consultant Neurosurgeon</del>   <i>Dublin, Ireland</i>	<b>July 2023</b>
<b>Nephrology, University Hospital Limerick</b> – with Dr. Liam Casserly, <del>Lead Clinical Nephrologist</del>   <i>Limerick, Ireland</i>	<b>June 2023</b>

### Courses

<b>Weekly Teaching</b> – The Neuroanatomy Collective, London   <i>Online</i>	<b>since Jan 2024</b>
<b>Minor Surgery Training</b> – Kingsbridge Training Academy, Belfast   <i>Drogheda, Ireland</i>	<b>Feb 2024</b>
<b>Neuro &amp; Spinal Surgery, part 1</b> , Surgical Undergraduate Peer Teaching Alliance (SUPTA) UK   <i>Online</i>	<b>July 2023</b>
<b>Neuro &amp; Spinal Surgery, part 2</b> , Surgical Undergraduate Peer Teaching Alliance (SUPTA) UK   <i>Online</i>	<b>July 2023</b>

### Conferences

<b>Sylvester O'Halloran Perioperative Symposium</b> , University Hospital Limerick   <i>Limerick, Ireland</i>	<b>2024</b>
<b>13th International Conference for Healthcare and Medical Students</b> , RCSI   <i>Dublin, Ireland</i>	<b>2024</b>
<ul style="list-style-type: none"><li>• Workshops – <i>Advanced Suturing, Plastic Surgery/Grafting Demo</i></li></ul>	
<b>NANSIG Conference 2024: A Career in Brains</b> , St. George's, University of London   <i>United Kingdom</i>	<b>2024</b>
<ul style="list-style-type: none"><li>• Workshops – <i>Microsurgery, Stereotactic Neurosurgery/Functional Brain Lesioning, Neurospine Case Discussion</i></li></ul>	
<b>Irish Spine Society Annual Meeting</b> , Galmont Hotel   <i>Galway, Ireland</i>	<b>2023</b>
<b>3rd Medical Student World Congress of Neurosurgery</b> , University Medicine Neumarkt   <i>Hamburg, Germany</i>	<b>2023</b>
<ul style="list-style-type: none"><li>• Workshops – <i>Craniotomy/drilling burr-holes, Microscopic Aneurysm Clipping, VP Shunt Valve demo</i></li></ul>	
<b>CATALYST 2021: Canadian Psychedelic Research Summit</b> , Mount Royal University   <i>Calgary, Canada</i>	<b>2021</b>
<b>4th Annual Neuroscience Symposium</b> , University of Saskatchewan   <i>Saskatoon, Canada</i>	<b>2020</b>

## Presentations

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<b>Poster</b>   13th International Conference for Healthcare and Medical Students (ICHAMS)   <i>Dublin, Ireland</i> "SEX-SPECIFIC GUT MICROBIOME DIFFERENCES IN A MOUSE MODEL OF AUTISM."	<b>2024</b>
<b>Presentation</b>   18th Annual Intercollegiate Surgical Case Presentation – RCSI Charter Week   <i>Dublin, Ireland</i> "METASTATIC SPINAL CORD COMPRESSION SECONDARY TO PANCREATIC NEUROENDOCRINE CANCER."	<b>2024</b>
<b>Presentation</b>   ADAPT Domestic Abuse Services   <i>Limerick, Ireland</i> "RECOGNIZING MENTAL HEALTH ISSUES (AND WHEN TO SEEK HELP)."	<b>2023</b>
<b>Presentation</b>   APP Departmental Seminar   <i>Saskatoon, Canada</i> "USING CPN60 AMPLICON SEQUENCING TO STUDY MICROBIOME CHANGES IN A TRANSGENIC MOUSE MODEL OF AUTISM."	<b>2021</b>
<b>Poster</b>   4th Annual Neuroscience Symposium   <i>Saskatoon, Canada</i> "DYSBIOSIS OF THE GUT AS A NEURODEVELOPMENTAL STRESSOR IN THE CONTEXT OF AUTISM."	<b>2020</b>
<b>Presentation</b>   Psychiatry 851 Seminar, College of Medicine   <i>Saskatoon, Canada</i> "PSYCHOTHERAPY-INDUCED CHANGES IN BRAIN STRUCTURE: A REVIEW AND CRITIQUE."	<b>2019</b>

## Research output

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### Published works | $n = 3$

Abstract | **G. O'Byrne**, C. Fernando, R. Heistadt, J. Nyarko, M. Quartey, P. Pennington, J. Hill, and D. Mousseau. *Sex-specific variation of intestinal flora in a novel mouse model of autism spectrum disorder. BMC proceedings*, 2024.

Abstract | Jaifar Alomairi, Stephen Clare, **George-Paul O'Byrne**, Deirdre Nolan, Paula Corr, Suzanne Murphy, Nektarios Mazarakis. *The incidence of primary spinal tumours in a single neurosurgery unit in Ireland over a five year-period. BMC proceedings*, 2024.

Thesis | **G. O'Byrne**. *Sex-dependent gut microbiome differences in a mouse model of autism*. Master's thesis. Saskatoon, Canada, 2021. <https://hdl.handle.net/10388/13347>

### Manuscripts submitted/under review | $n = 2$

Review / Meta-Analysis | J. Siswanto, M. O'Connor, A. Purnomo, L. Kelly, C. Budiputri, **G. O'Byrne**, Aashish Aggarwal, R. Heriyanto, E. Marcella, U. Patel, F. Kong, S. Kataria, A. Nkene, J. Wijaya. *AI for Antenatal CHD Detection: A Systematic Review / Meta analysis*. Submitted to JAMA Pediatrics, Jan 2024.

Cohort study (animal) | **G. O'Byrne**, C. Fernando, R. Heistadt, J. Nyarko, M. Quartey, P. Pennington, J. Hill, and D. Mousseau. *Sex-dependent differences in the proportional abundance of akkermansia muciniphila in a transgenic mouse model of autism*. Submitted to Frontiers: Physiology in late 2023, currently addressing reviewer suggestions.

### Ongoing projects | $n = 5$

Review / Meta-analysis | **G. O'Byrne**, J. Alomari, S. Crane, S. Murphy. *Influence of causative organism on surgical management of spinal abscess in adults: a systematic review and meta-analysis*. Intended for publication in JNS - Journal of Neurosurgery. Current stage of project: search of literature, ongoing since Feb 2024.

Literature review | **G. O'Byrne**, A. Zaheer, S. Abrar, A. Ramsook. *The gut-brain axis: clinical implications in brain and spine surgery*. Journal tbd. Current stage of project: search of literature, ongoing since Jan 2024.

Retrospective study | S. Murphy, N. Mazarakis, J. Alomari, **G. O'Byrne**, S. Crane, K. Bolger. *The impact of intraoperative electrical monitoring on the functional outcomes of spinal surgery patients*. Journal tbd. Current stage of project: data collection.

Retrospective study | S. Murphy, N. Mazarakis, D. Nolan, P. Corr, J. Alomari, **G. O'Byrne**, S. Crane. *The incidence of primary spinal tumours in a single neurosurgery unit in Ireland over a ten-year period*. Intended for publication in JNS - Journal of Neurosurgery. Current stage of project: data collection.

Retrospective study | A. Jalali, **G. O'Byrne**. *Using statistical models to identify immune biomarkers for prostate cancer*. Intended for publication in Cancers. Current stage of project: manuscript writing.